



(RESEARCH ARTICLE)



The situational approach in adult education: Modeling situations using the vee diagram

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Abstract

Much educational research has raised the effectiveness of situational teaching or training approaches, especially for adult learners in work situations, due to their social and professional nature. The situational approach (SAP) or situated learning (SL) to refer to the learner, stipulates that learning cannot be isolated from the context of its applications, and that knowledge is inseparable from action.

In this context, the situation becomes central in the acquisition of knowledge and the development of capacities and skills, which are now the aims. We therefore deduce that any design, development and implementation of e-learning training for adults is imperatively based on the modelling of the said learning situation.

The objective of this article is to analyze certain models of situations and to propose a model-process more relevant with e-learning training for adults. For the sake of modelling visibility, we use a modified model of the Vee diagram from Gowling's model.

Keywords: Learning approach (AS); Adult e-learning training; Model – process; Modified model of the Vee diagram

1. Problematic

Adult learning in formal, informal and even more in the workplace is a difficult field to study because of its contextual, self-directed, implicit and tacit nature. It includes aspects of individual and shared cognition, social interaction and cognitive flexibility. It is the subject of numerous research works in the fields of adult learning, continuing education, training in the workplace and lifelong learning [1, 2, 3, 4, 5, 6].

Adult learning is often associated with the situational approach or the situated learning approach, insofar as this theory emphasizes the anchoring of knowledge in situations and on relationships and the interactions of learners with their prior knowledge but also because situated learning is strongly dependent on collaborative activities [7, 8].

In face-to-face training, it is not mandatory to design a situated learning situation by accounting for all the cognitive, procedural and processing processes that can be generated or implemented during the teaching - learning situation. The spontaneity available to the teacher or expert trainer enables him to detect the various difficulties and to offer the suggestions and the necessary help to the learners [9, 10].

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On the other hand, in e-learning mode, it is up to the computer system and the intelligent virtual tutor to observe and analyze the processes of learner interactions - situation. Therefore, we think, that it is essential for the designer and subsequently for the developer of the learning located online to foresee the different thinking processes, methodological processes and processing processes in order to program the various suggestions, the teaching and didactic aids. And relevant feedback.

The objective of this research work is to propose a model of an online learning situation from an action-oriented perspective, by relying on a modeling diagram which has been shown to be effective in significant learning by numerous researches, which is the Vee diagram.

2. Theoretical framework

2.1. The situation-based approach in adult training

Situational approach, situational didactic, contextual approach or situated cognition all relate to the same basic theory, situated learning theory [7, 11, 12, 13, 14, 15, 16, 17, 18, 19]. This theory was first defined by Brown and colleagues as a teaching model opposing the separation between knowledge and actions, and was then developed and presented by Lave & Wenger [20, 21].

Since then, this theory has been exploited widely in the fields of science education, continuing education, or adult education and lifelong learning [22, 23, 24, 25, 26, 27]. It has enabled researchers, educators or trainers to understand how knowledge is developed, organized and anchored in the memory of learners, or how to approach representations [28]. The situation-based approach has made it possible to better understand, analyze and design training programs that make it possible to achieve a good level of learning output [7]. Such was the influence of this theory to the point that some researchers believe that learning can only be meaningful if it is integrated into a social and physical context.

The situated learning theory or situational approach inspires its foundations from different fields, such as psychology, sociology, cognitive science and anthropology [29]. According to this theory, learning is not isolated from application contexts, disruptive events, daily habits and problems to be solved. The theory of situated learning or situational learning places the adult learner at the center of a pedagogical model that interacts the following four components: content, tasks or process, context and social community [30].

Agreeing with Lave and Wenger, Norainna points out that situated learning theory suggests that the implementation of effective teaching or training requires the integration of learning into authentic practice contexts, where learners engage in increasingly complex tasks within social communities [31]. Located learning then takes place in a social and collaborative context around a complex learning situation involving shared located cognition and cognitive flexibility.

The concept of competence constitutes the core of the problematic of the theory of situated learning or of the situational approach. Being competent is knowing how to act in a situation. Competence is built and evolves in situation. The situation then constitutes the purpose of in-service training. It can be deduced that training through situations is based on the principle that a person builds, adapts and develops in situation and in action by relying on his own experiences and pre-acquired knowledge and on those of others. . The importance is no longer given to the knowledge or skills of the learner but rather to the mobilization of different cognitive, metacognitive and emotional resources in different situations.

The situational or situational learning approach places learning content in situations, systematically contextualizes them and seeks conditions that allow learners to construct the meaning of their knowledge and approaches [32]. A meta-analysis of American research published from 1980 to 2004 on the effect of specific science teaching strategies on the success of learners showed that strategies based on the contextualization of learning content and in collaborative mode allow better results in learners [33]. It should be noted, however, that all the theorists of situated approaches, however varied they may be, agree on the fact that the situation is constitutive of activity and that situations are an integral part of cognition and learning [7]. Further, Mayers & Freitas used the theory of situated learning as the theoretical foundation for analyzing and understanding learning in web 2.0 environments [34].

By way of summary, we can make a systematic representation of what is the situation-based approach and the status of the situation in this approach:

The situated learning and the pedagogical approach by the situations are anchored in a perspective of human and social development, and are founded on the principle according to which a person builds in interaction, develops and adapts his knowledge and his competences through his experiences. And its actions in a complex and authentic situation;

The situation is central in this training and learning approach. Skills are at the heart of this situation. They are its finality.

2.2. Status of the concept of situation in the perspective of learning by situations

In pedagogy, situating means giving meaning to learning, placing learners in a contextual framework of learning, involving them in the construction of their learning and the creation of their knowledge. In adult education, situating learning means creating authentic complex situations relevant to the needs of learners.

The journal *Recherches en Education* devoted a special number to the notion of “learning situation” [35], in which several researchers presented and analyzed the notion of the learning situation from different epistemological, social, but above all didactic angles. .

According to Faerber [36], the learning situation refers to three concepts: a problem stated by the teacher / trainer, a treatment of the problem by learners alone or supervised by the teacher / trainer and a technological, social environment. The learner is in.

All the definitions proposed meet that proposed by Jonnaert and his collaborators in the UNESCO Chair in Curriculum Development [7]: “A situation is a more or less organized complex set of circumstances that a person experiences at a given moment. We cannot exclude the social dimensions of the circumstances of the situations”.

An Anglo-Saxon conception made of pragmatism whose finality is human development. In this conception, the relation to the life experiences of the learners is very present, which implies according to this orientation, to place the contents (cognitive, metacognitive, approaches, techniques, tools ..), the interactions and the context in complex situations and authentic, meaningful to the learner and the community of learners.

There are different typologies of situations; Brousseau [29] classifies situations according to their degree of formality: informal (everyday) situations and formal situations. Faerber [39], for his part, distinguishes between face-to-face and distance learning situations. In the case of adult training, we can draw inspiration from the classification made by Hommage [37]:

Problem situations organized around the crossing of a previously identified obstacle. These "obstacle" situations require the learner to initiate a process of accommodation and adaptation to his environment [38]. The situation must offer sufficient resistance for the learner to reinvest his prior knowledge and representations. However, the situation should not appear to be out of reach, it is in the development proximity zone;

- Integration situations, through which the aim is to ally knowledge and know-how, previously studied as part of a training program;

Key situations: This term is borrowed from the work of Evoquoz which proposes, through scenarios, to assess the key skills particularly in demand in the world of work [39]. These situations are tailor-made and not necessarily related to real situations, even if they involve a certain number of components;

Complex task situations or didactic situations are rooted in the social and cultural reality of learners, in contexts that may really have meaning for them. We will thus ensure to offer learners a rich material environment, made up of authentic documents, manipulable objects of information emanating from multiple sources.

3. Towards a modelling of learning situations in distance training

3.1. The problem of modelling learning situations

Even if it seems difficult to foresee all the knowledge, all the processes and the interactions that can be generated or put in place by the learning situation, because of its complexity and its status in the perspective of a situated learning, we can always, by agreeing with Ansaldi to approach the modelling of a learning situation in order to try to understand how the cognitive, metacognitive and emotional processes unfold, and to identify their real natures in order to apprehend the conditions of their effectiveness in a learning situation [40, 41].

In pedagogical engineering driven by models, the modelling of distance learning situations will allow the designer of an adult e-learning computer system to anticipate the obstacles and difficulties in learning in order to integrate in the tutor

systems, the suggestions, the didactic aids but especially the adaptations necessary with the learning styles of the learners.

The literature reveals several attempts at modelling learning situations. Dunkin & Biddle proposes a situation model “teaching-learning situation in the classroom” bringing into interaction four components the teacher, the learner, the context and the object of the learning, by evoking the different variables inferred in each component [42]. We can simplify this model as follows.

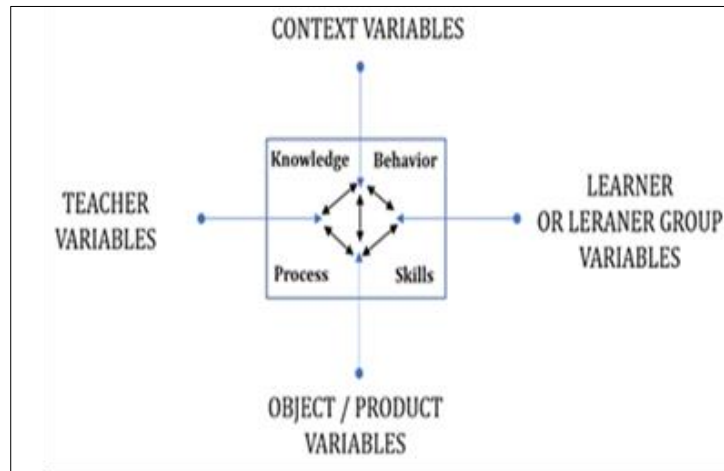


Figure 1 Simplified model of learning situation according to Dunkin & Biddle [42]

A situation model which by interaction of the four components can generate and develop knowledge, skills, cognitive processes, attitudes and behaviours.

For its part, Gage proposes a process – product model, in which the learning situation is made up of four components which are, the teacher, the situational context, the teaching process and the learner considered in this model by his performance in relation to the situation [43]. The following figure illustrates this model.

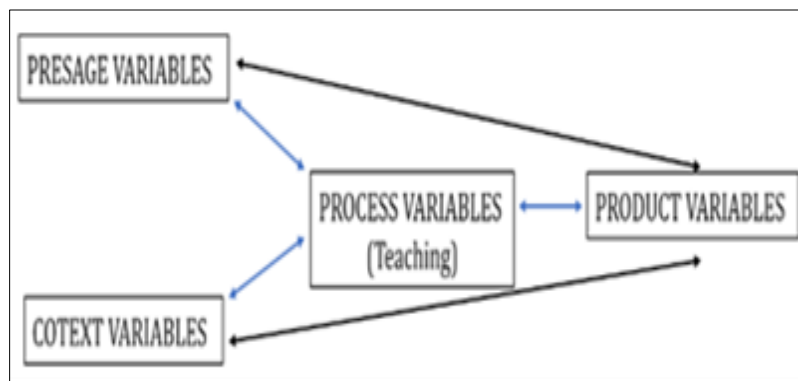


Figure 2 Gage process product model [43]

Another more significant model is proposed by Claret focusing much more on what the learner will do, highlights the interaction between the teaching processes and the processes of learning from the tasks that will be carried out the learner and the communication actions that will be generated [44]. The following figure illustrates this model.

Derobertmeasure & Dehon have proposed a classroom situation model centered on the relationships and interactions between teacher and learner (s) and which can be very useful in the design and implementation of adult learning situations in the context of 'e-learning training [45]. The following figure illustrates this model.

As for Hérold, he proposes a modelling of the teaching-learning situation from a systemic perspective, taking into account the different interactions between teachers, learners, didactic resources and content to be taught in a given

environment and where the learner is at the center. of the system, while the teacher is the facilitator [46]. The dynamic and functional aspect of the situation results from the interaction between these different components of the situation. The following figure illustrates this model.

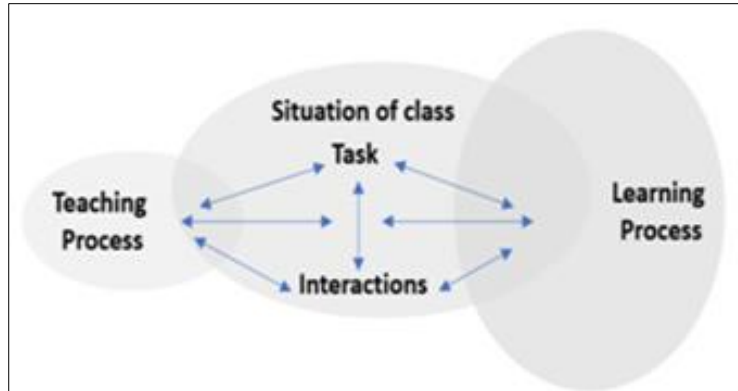


Figure 3 Process teaching model according to Claret [44]

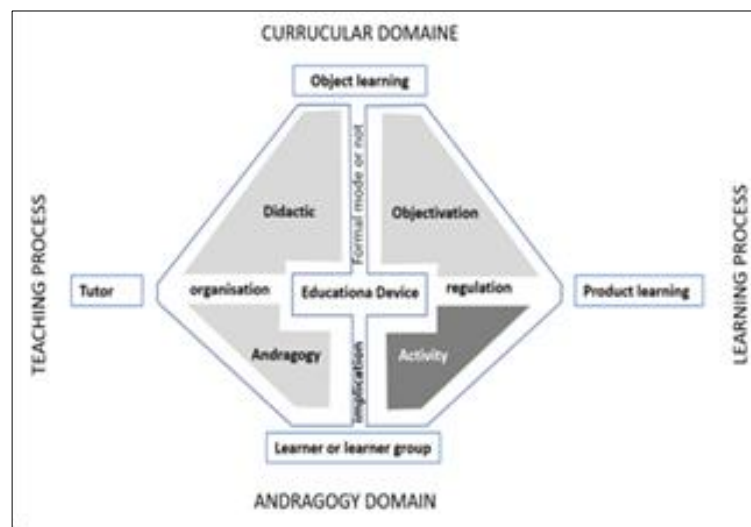


Figure 4 Diagram of the modified model of teaching/learning practice from Derobertmasure & Dehon [45]

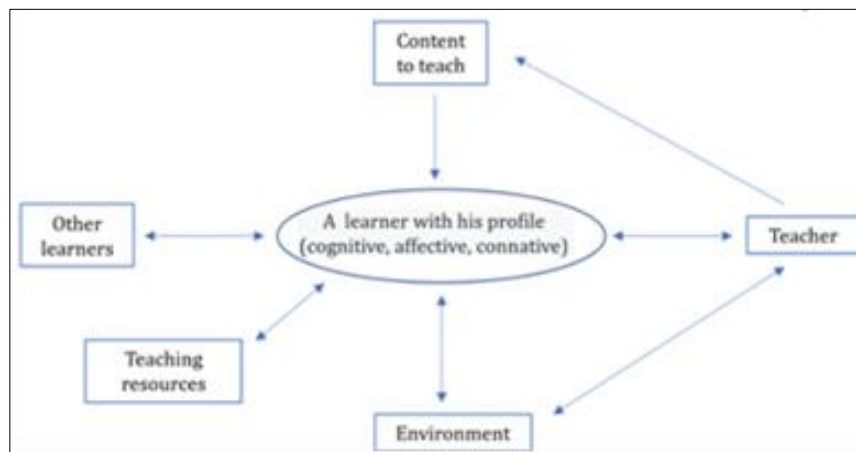


Figure 5 Model of the teaching-learning situation from Herold [46]

Dumont and Istance propose a model of a classroom learning situation, highlighting the dynamics and interactions between four dimensions: the learner, the teacher, the content to be taught and the equipment that will serve as tools. For teaching-learning [47].

Regarding the modelling of learning situations in e-learning mode, very little research has addressed the question of the design and modelling of the learning situation according to a specific perspective or learning approach, with the aim of to implement it in a computer system. Most of the research has focused on questions of learner modelling, content and e-Learning platforms.

By focusing on the modelling of educational activities in an EIAH (computer environment for human learning) concerning reading, Cléder and his collaborators propose a modelling of the situation in terms of knowledge and rules in order to account for the learner activities [48]. This modelling is inspired by the analytical work carried out by Quanquin and Chembreuil in 2006 on the interactions between the computer system and the learner and which gives access to three types of information organizing the representation of the pupil, which are [49]:

- The knowledge to be put in place and their status;
- The cognitive and metacognitive processes to be implemented during the activity;
- Observable behaviours.
- Very recently, Khaldi and his collaborators proposed an architectural model of the e-learning learning situation integrating four dimensions [50]:
- Learner profile;
- Skills to perform;
- Specific knowledge to structuring;
- Contextual learning.

As a summary of this section, all of these situation models reflect the general aspect of the situation, its entities and the interactions between these different entities. These models represent the situation as a teaching situation rather than a learning situation. These types of modelling agree on the fact that a classroom learning situation integrates four interacting components: the learner, the teacher, the context and the teaching material, which can be interesting at first for designers of e-learning learning situations.

In the case of distance learning, the models presented, although they may provide additional information regarding the consideration of cognitive and metacognitive processes in the structuring, organization and implementation of databases on learning situations, they do not provide enough data or clear algorithms for programmers and IT developers of IT systems and e-learning tutors, especially when it comes to aligning a training approach of adults by situations.

3.2. Towards a modelling of learning situations located using the Vee diagram.

3.2.1. The Vee diagram and its use in education

The Vee diagram got its name from its "V" shape. It makes it possible to visualize a complex situation. Concretely, it makes it possible to structure a learning situation around a problem to be solved or a key question, by articulating the theoretical basis and precise processing procedures in a well-defined context. It is therefore both a heuristic procedure diagram, a knowledge structuring diagram and an explicit declaration diagram [51].

The Vee diagram was originally designed by Gowin in 1970 [52]. This diagram inspires its theoretical foundations in Ausubel's theory of meaningful learning and the development of work on learner performance in problem solving in science. In its original form, the Vee diagram incorporates two branches "Thinking" & "Doing" and an area of interactions between the two branches. The conceptual part "Thinking" includes theories, principles, concepts, etc. and the part of the Vee "Doing" includes methodological tools. The following figure illustrates this model.

Research on the use of the Vee diagram in education and training is extensive. The original diagram has been altered many times and evaluated by research in many ways. This research has shown that the Vee diagram is one of the effective tools that allows the development of metacognitive skills, meaningful learning, or critical thinking in adults in training [51, 53, 54, 55].



Figure 6 Gowin's epistemological Vee [52]

The use of the Vee diagram in learning makes it possible to establish significant links between prerequisite knowledge and new knowledge, to develop communication skills between learners in a collaborative situation [56, 57]. The Vee diagram can be used to implement inquiry and inquiry-based learning modes [58].

3.2.2. Proposition d'un modèle de situation d'apprentissage situé et sa modélisation à l'aide du diagramme Vee

In this research work, we propose a model of a learning-process situation, from a situated learning perspective, composed of three entities: thinking processes, methodological processes and process transformations. And to explicitly capture the different cognitive, metacognitive and communicative processes that can be involved in adult online learning, we will use the modified Vee diagram, shown in Figure 7

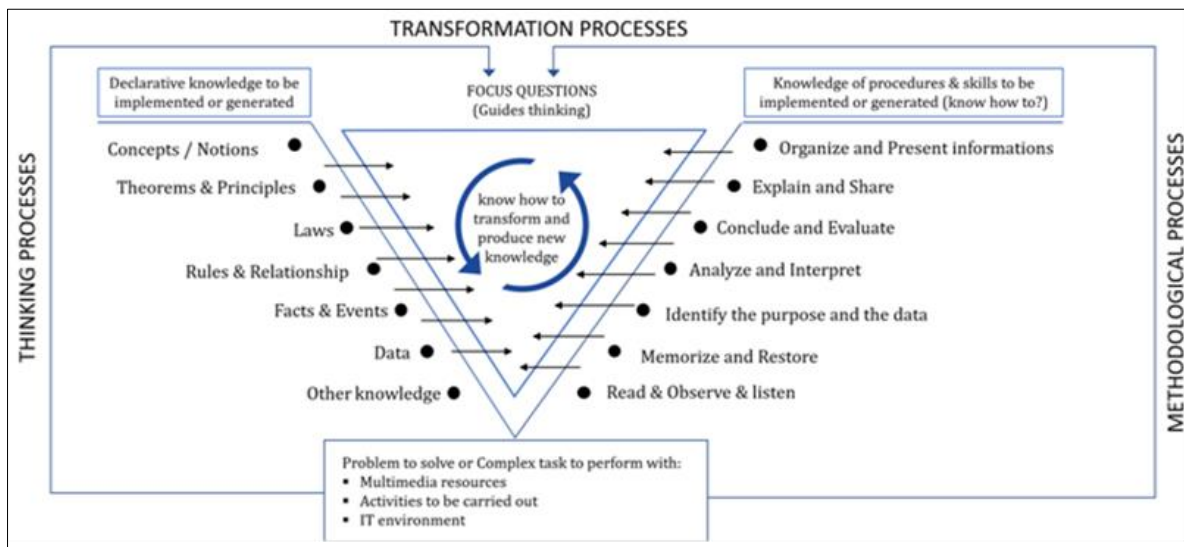


Figure 7 Modeling of the learning situation with modified vee diagram of gowin

The branch on the right refers to the different knowledge or declarative knowledge involved in or by the problem to be solved (or the complex task to be performed). This knowledge calls on the processes of memorization, restitution and conceptualization. The branch on the left presents all the procedures and methodological skills to be implemented to deal effectively with the problem to be solved. The inner triangle brings together the different interactions between the

two branches (networks of transformations and the production of new knowledge, in order to master the problem and find the solution.

The advantage of this modelling and the advantage of using the Vee diagram is that it can give more visibility to developers of computer systems and tutors to the extent that it allows to specify upstream the nature of the " object of the situation (problem or complex task to be solved by specifying the resources to be exploited, the tasks to be carried out, the context which gives meaning to the situation, etc.), the knowledge to be put in place or to be generated, the cognitive and metacognitive skills to implement or generate, the various transformations to perform and the solution to find.

Each learning situation is implemented in the system according to precise algorithms, which will allow the tutor system, once the adult learner begins to deal with a situation of his choice, to follow in the footsteps of his collaborative activities, his reasoning, the knowledge and skills generated and the transformations it carries out, obviously in relation to the model of the situation available to the system.

4. Conclusion

Teaching / training / learning situation models can be useful and carry relevant information for teachers and trainers in their conceptions of learning situations. However, we believe that these situation models do not make it possible to account for the different processes that a designer (modelling phase) or a developer (coding and implementation phase) of e-learning learning needs to know in order to put into practice. Place an intelligent tutor system or expert system.

The learning context model represented by the Vee diagram will focus on the process to be developed in the e-learning learning process by fixing the nature of the contextual object and the knowledge to be learned upstream, the implementation or generation, the cognitive and metacognitive skills to be implemented or generated, the various transformations to be made, and the solutions to be found.

Each learning situation is implemented in the system according to a precise algorithm, which will allow the tutor system, once the adult begins to face the situation he chooses, to follow in the footsteps of his collaborative activities, of its reasoning, of its knowledge and skills generated and the conversion carried out is obviously linked to the situation model available in the system.

Our next article will be devoted to the choices, the development process, the modeling language and the development languages and tools as well as the development of our system.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

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